

The value of diversity in the renewable energy industry and research community

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Abstract—Part of creating a successful solar industry is developing a capable workforce. It has been repeatedly shown that organizations and companies are more productive when they have diverse and inclusive cultures. The solar industry in the U.S. performs well in some aspects (non-white workforce, positive work environment) but drastically under-performs in many others. We discuss these metrics and how this impacts the renewable energy industry and the solar research community. We highlight some initial actions which are necessary to begin to remediate these deficiencies, such as demographic tracking, recruiting strategies, and mentoring. We also present the historical and ongoing efforts to improve the diversity and inclusion of the Photovoltaic Specialists Conference, particularly through the work of this year’s Diversity and Inclusion (D&I) oversight committee. This year’s D&I committee is implementing diversity tracking, a women’s lunch, a diversity lunch, childcare resources, pronouns on badges, gender-neutral restrooms, addressing accessibility issues, and publishing a diversity statement and code of conduct to the PVSC website.

Index Terms—diversity, gender, inclusion, intersectionality, PVSC, solar, workforce

I. INTRODUCTION

We are in the midst of a clean energy revolution, with a dramatic shift in the global energy sector moving to large scale deployment of renewable energy technologies. There is growing evidence and documentation that science and innovation are more productive when research communities are diverse and inclusive [1]. However, a recent survey of workers in the solar industry (not including academic research) showed that women represented 26.3% of the solar workforce, while gender non-binary employees comprised 1.4%. Hispanic or Latino workers represented 16.9% of the workforce, Asian workers represented 8.5%, and black or African American workers comprised 7.6% [2]. While many organizations are starting to recognize the value of diversity, 88% of senior executives are white and 80% are male for U.S solar companies [2]. These numbers show that the industry has much more work to do to reflect the growing diversity of the larger population to ensure that the workforce has the talent, resources, and expertise to tackle the clean energy transition.

The first step to improving diversity and inclusion is understanding where we are today. We will present summaries of recent studies that looked at the current status of women and underrepresented minorities in the renewable energy workforce, as well as best practices that organizations can undertake to improve the recruitment, retention, and advancement of women and other underrepresented individuals within their ranks.

II. QUANTIFYING THE VALUE OF DIVERSITY

A great deal of research has been carried out to quantify the value of having a diverse and inclusive workplace. A recent study by from McKinsey shows that U.S. companies that have higher executive-level diversity are more profitable [3]. International analysis by Credit Suisse shows similar results [4]. Some of the reasons given for the improved performance arise from the fact that when a workplace is diverse, people are more likely to have different approaches to solving problems, making the organization stronger as a whole, and by stimulating creativity, cooperation, innovation [5].

III. DATA FROM THE U.S. SOLAR INDUSTRY

The Solar Foundation and the Solar Energy Industries Association (SEIA) have published two comprehensive studies on the state of Diversity in the U.S. Solar Industry [2]. These studies were based on large surveys of workers across the U.S. solar industry, but did not focus on solar-related academic research. The study provides much more detail than can be presented here, but points out that the solar industry is not alone - related industries to solar have similar underrepresentation compared to nationwide demographics - but with the rapid growth in photovoltaic deployment, the solar industry has an opportunity to lead the shift to a more diverse workforce.

Some key findings are summarized below:

- The solar workforce is 73% white as compared to 78% in the general U.S. workforce, due to higher representation

of Asian and mixed races. However, the percentage of black employees in the solar industry is 4% lower than the general U.S. workforce.

- 88% of solar executives are white and 80% are men.
- The solar workforce is only 26% women, as compared to 47% in the general U.S. workforce.
- Women make 74 cents on the dollar compared to men in the solar industry.
- 36% of solar companies track employee diversity – this is an improvement over 2017 when only 27% of solar companies tracked this information.
- Only 22% of solar firms have a strategy to increase representation of women (compared to 7% in 2017) and only 24% have a strategy to increase representation of people of color (compared to 14% in 2017).
- Solar companies often rely on networking for hiring, however this can limit their pool of diverse candidates. Almost half of white employees or non-Hispanic employees found their job via networking, compared to 28% of Hispanic or Latino employees and 28% of black or African American employees.
- The majority of solar workers (73%) reported a positive working environment.

The report illustrates that while the solar industry has many areas requiring significant improvement, it does display a few exceptional workforce characteristics. Furthermore, it has clearly demonstrated progress in the past few years and should build on this momentum to continue its trajectory towards a truly diverse workforce. The Solar Foundation and SEIA have also published a best practices guide which helps outline a path forward for improving diversity in the solar industry [6].

IV. DIVERSITY AND INCLUSION AT PVSC

Technical and scientific conferences serve as venues for people interested in specific scientific topics to share research progress, reconnect with colleagues, and foster scientific collaboration. However, technical conferences often do not feel inclusive to people who do not have the traditional (cis white male) background. There is a growing awareness that inclusion, diversity, and equity are important to run successful scientific meetings [7].

The IEEE Photovoltaic Specialists Conference (PVSC) has a long tradition of having a unique and collegial environment focused on the science of photovoltaic systems. However, it has recently been recognized that more work is needed to improve the diversity and inclusion at this event to make it welcoming to people from different backgrounds.

To address the issues of diversity and inclusion within the PV research community, in 2019, an informal committee (The Diversity and Inclusion oversight committee) convened to ensure that the global diversity of the community in which the PVSC serves is represented in all aspects of the organization and that our PVSC leaders are addressing diversity needs and/or concerns appropriately.

Over the history of the conference, different programs and initiatives have been taken to address diversity and inclusion

issues. Some of the historical programs and recent actions taken by the committee are listed below.

- Women in PV: The Women in PV program has been a successful mainstay of the conference. The first Women in PV event was organized in 2010 at the 35th PVSC by Veronica Bermudez, and consisted of a panel discussion [8]–[14]. Led by Maria Gonzales and others, in 2014 this event evolved into a luncheon event with a keynote speaker that has been very popular and a great way to highlight female leaders in the field and discuss gender-related issues in the PV community.
- Minority Carriers: More recently, it was recognized that other under represented groups and individuals with intersectional diverse identities also would benefit from a networking/education event. Led by Lyndsey McMillon-Brown, in 2020 PVSC is launching a “Minority Carriers” event, to provide a forum for these conversations.
- Support for parents: Childcare is a major challenge for many early career scientists, and many conferences are starting to recognize this and offer support [15]. Starting in 2019, nursing and family rooms have been made available for attendees of PVSC (led by Emily Warren). While the conference is taking place virtually in 2020, in future years, the conference is planning to experiment with providing reimbursements for childcare.
- Adopting best practices: To ensure that the PVSC conference is inclusive to everybody, it is important to provide information to attendees about the organizations commitment to diversity and inclusion and what the expected code of conduct is for attendees. To support this goal, starting in 2020, a clearly defined “Code of Conduct” and “Diversity Statement” have been added to the conference website.
- Improving inclusivity: In future years, the conference will be providing an option for people to provide their pronouns on name badges, and provide gender neutral restrooms in the conference facility. Work is ongoing to ensure access to the conference for people who are differently abled [16].
- Demonstrating progress requires data: The PVSC conference has historically not tracked the identities (gender, ethnicity, other under-represented status), but many resources point out the importance of having baseline data to monitor future progress [7]. The D&I committee has been working with the registration team to collect data that will allow us to track the impact of different initiatives, while maintaining the privacy of all conference-goers. For PVSC 47, optional demographic questions were included in the conference registration process, and we will report on those baseline numbers during this presentation.

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